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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,888	02/27/2002	David M. Hoffman	GEMS8081.097	7804

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EXAMINER	
HO, ALLEN C	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 10/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

P-S

Office Action Summary	Application No.	Applicant(s)	
	09/683,888	HOFFMAN, DAVID M	
	Examiner	Art Unit	
	Allen C. Ho	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/27/02* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
4) ☐ Interview Summary (PTO-413) Paper No(s) _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hoffman *et al.* (U. S. Patent No. 6,087,665).

Hoffman *et al.* disclosed a fiber optic scintillator cell comprising: a first component (**104**) formed of scintillating material; and a second component (**108**) formed of optically stimulated material.

3. Claims 1, 2, 4-7, 9, 10, 13, 14, and 23-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Gross *et al.* (U. S. Patent No. 6,310,352 B1).

Gross *et al.* disclosed a detector for computed tomography system (column 1, line 20), the detector comprising: a first component formed of scintillating material (column 6, lines 28-29), and a second component formed of optically stimulated material (column 6, lines 43-45), wherein the first component and the second component are intermixed with one another forming

a single composite structure (Fig. 4), and wherein the optically stimulated material includes material that my be changed to an excited state by a laser (column 7, lines 59-63); a fiber optic scintillator configured to receive high frequency electromagnetic energy (**4**) having a first intensity and further configured to output light energy (scintillation light) having a second intensity, wherein the second intensity exceeds the first intensity; a photodiode optically coupled to the scintillator and configured to detect the light energy output from the fiber optic scintillator (column 8, lines 14-15).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 4-7, 9, 10, 13-16, 19-21, and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman (U. S. Patent No. 6,115,448) in view of Gross *et al.* (U. S. Patent No. 6,310,352 B1).

Hoffman disclosed a CT system comprising: a rotatable gantry (**12**) having an opening (**48**) to receive a patient (**22**) to be scanned, a high frequency electromagnetic energy projection source (**14**) configured to project a high frequency electromagnetic energy beam toward the object; a scintillator array (**56**) having a plurality of scintillator cells, wherein each cell is configured to detect high frequency electromagnetic energy passing through the object, a photodiode array (**60**) optically coupled to the scintillator array and comprising a plurality of

photodiodes configured to detect light output from a corresponding scintillator cell, wherein each photodiode outputs a signal indicative of the light output of the corresponding scintillator cell (column 3, lines 32-38); a data acquisition system (DAS) (**32**) connected to the photodiode array and configured to receive the photodiode outputs; and an image constructor (**34**) connected to the DAS and configured to reconstruct an image of the object from the photodiode outputs received by the DAS.

However, Hoffman did not teach that each scintillator cell is configured to output light energy having an intensity exceeding an intensity of the high frequency electromagnetic energy detected by the cell.

Gross *et al.* disclosed a scintillator cell for computed tomography system (column 1, line 20), the scintillator cell comprising: a first component formed of scintillating material (column 6, lines 28-29), and a second component formed of optically stimulated material (column 6, lines 43-45), wherein the first component and the second component are intermixed with one another forming a single composite structure (Fig. 4), and wherein the optically stimulated material includes material that my be changed to an excited state by a laser (column 7, lines 59-63), a fiber optic scintillator configured to receive high frequency electromagnetic energy (**4**) having a first intensity and further configured to output light energy (scintillation light) having a second intensity, wherein the second intensity exceeds the first intensity; a photodiode optically coupled to the scintillator and configured to detect the light energy output from the fiber optic scintillator (column 8, lines 14-15). Furthermore, Gross *et al.* taught that this scintillator cell has a better signal-to-noise ratio (column 2, lines 30-32).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ an array of scintillator cells disclosed by Gross *et al* in a CT system, since a person would be motivated to increase the signal-to-noise ratio in order to produce an image that has less noise.

6. Claims 1, 2, 4-6, 8-10, 13-15, 17-21, and 23-27 rejected under 35 U.S.C. 103(a) as being unpatentable over Eberhard *et al.* (U. S. Patent No. 5,712,926) in view of Gross *et al.* (U. S. Patent No. 6,310,352 B1).

Eberhard *et al.* disclosed a CT system, part of a baggage handling facility, comprising: a rotatable gantry (**100**) having an opening to receive a baggage (**B**) to be scanned; a high frequency electromagnetic energy projection source (**10**) configured to project a high frequency electromagnetic energy beam toward the object; a scintillator array (**20**) having a plurality of scintillator cells, wherein each cell is configured to detect high frequency electromagnetic energy passing through the object; a photodiode array optically coupled to the scintillator array and comprising a plurality of photodiodes configured to detect light output from a corresponding scintillator cell (column 3, lines 34-37), wherein each photodiode outputs a signal indicative of the light output of the corresponding scintillator cell; a data acquisition system (DAS) (inherent) connected to the photodiode array and configured to receive the photodiode outputs; and an image constructor (**200**) connected to the DAS and configured to reconstruct an image (column 3, lines 20-22) of the object from the photodiode outputs received by the DAS.

However, Eberhard *et al.* did not teach that each scintillator cell is configured to output light energy having an intensity exceeding an intensity of the high frequency electromagnetic energy detected by the cell.

Gross *et al.* disclosed a scintillator cell for computed tomography system (column 1, line 20), the scintillator cell comprising: a first component formed of scintillating material (column 6, lines 28-29), and a second component formed of optically stimulated material (column 6, lines 43-45), wherein the first component and the second component are intermixed with one another forming a single composite structure (Fig. 4), and wherein the optically stimulated material includes material that my be changed to an excited state by a laser (column 7, lines 59-63); a fiber optic scintillator configured to receive high frequency electromagnetic energy (**4**) having a first intensity and further configured to output light energy (scintillation light) having a second intensity, wherein the second intensity exceeds the first intensity; a photodiode optically coupled to the scintillator and configured to detect the light energy output from the fiber optic scintillator (column 8, lines 14-15). Furthermore, Gross *et al.* taught that this scintillator cell has a better signal-to-noise ratio (column 2, lines 30-32).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ an array of scintillator cells disclosed by Gross *et al.* in a CT system, since a person would be motivated to increase the signal-to-noise ratio in order to produce an image that has less noise.

7. Claims 3, 11, 12, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman (U. S. Patent No. 6,115,448) and Gross *et al.* (U. S. Patent No. 6,310,352 B1) as applied to claims 1, 9, and 19 above.

Hoffman in combination with Gross *et al.* disclosed a CT system utilizing a fiber optic scintillator cell detector comprising: a first component formed of scintillating material, and a second component formed of optically stimulated material, wherein the first component

(cladding) surrounds the second component (fiber core); a scintillator array (**56**) having a plurality of scintillator cells, wherein each cell is configured to detect high frequency electromagnetic energy passing through the object; and a photodiode array (**60**) optically coupled to the scintillator array and comprising a plurality of photodiodes configured to detect light output from a corresponding scintillator cell, wherein each photodiode outputs a signal indicative of the light output of the corresponding scintillator cell (column 3, lines 32-38).

However, these references do not teach that the first component and the second component are arranged in a discretely layered stack.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to couple the first component and the second component in a discrete layered stack, since a person would be motivated to design the shape and dimension of these components according to the engineering requirement. That is, in order to incorporate the scintillator cell disclosed by Gross *et al.* into the scintillator array in Hoffman's CT system, the components would necessarily have layered structures, with the second component (optically stimulated material) sandwiched between the first component (the scintillator array) and the photodiode array.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(1) Peter *et al.* (U. S. Patent No. 6,362,480 B1) describe a radiation detector for CT.

(2) Takeda *et al.* (U. S. Patent No. 5,155,621) describe an optical fiber amplifier.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (703) 308-6189. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached at (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

Allen C. Ho
Examiner
Art Unit 2882

ACH
October 21, 2002